Central Region Wildlife Management Program



Project Title: San Joaquin Herd / Upper San Joaquin Watershed Telemetry Project

Project Location: San Joaquin Watershed Madera and Fresno Counties

Project Leadership: Tim Kroeker, Environmental Scientist

Proposed Start and Completion Date: January 1, 2013 through December 31, 2017

Executive Summary

The San Joaquin deer herd is in decline and much of the winter range is underutilized. In addition, based on location and timing of harvest, a large percentage of bucks harvested within the range appear to be resident deer causing concern that the migratory population may be even more suppressed. Increased resident population at low elevation and underutilized winter range may indicate that the limiting factor for migratory deer in this watershed is summer or fawning habitat condition. To gain understanding of the deer population on this range we are proposing a telemetry project. Telemetry data will help us locate, protect, and enhance key summer and winter range areas and the migration corridors throughout the range. Identified key areas can be described and compared to historical key areas in search of clues to habitat degradation and population decline. Telemetry data will give us information related to the importance and prevalence of resident deer within the watershed.

Statement of Need

Key areas and migration corridors, particularly in the western edge of the range and in the upper watershed on the Fresno County side of the San Joaquin River are not adequately delineated. The boundary for the western edge of the range is not defined by data and deer from the Oakhurst winter range are believed to utilize San Joaquin summer range (Jordan 1967). Complicating this factor is outdated knowledge of the percentage of resident deer in the watershed which masks the decline of the migratory herd. Lacking knowledge of deer habitat use and needs in this watershed will result in inadequate response to Forest Service management proposals. Management actions misdirected by limited understanding of deer resource needs will have the result of further population declines.

The management plan for The San Joaquin Deer Herd (Peabody, 1983) recommends identifying fawning habitat and key summer range concentration areas as well as all key summer and winter ranges. The Huntington Deer Herd Management Plan, which acknowledges that the Huntington Deer Herd is biologically a portion of the San Joaquin Deer Herd and refers to it as such in the plan (Rempel, 1984), recommends the same actions for that portion of the range. Additionally the plans recommend identifying migration corridors, particularly for routes above Mammoth pool and on the Fresno County side of the San Joaquin River. Recent herd plan updates recommend utilizing

GPS collars to gather this data. The summer range of this herd has historically been viewed as having limited capacity (Jordan, 1967). The range of this herd should be thoroughly investigated to identify limiting factors for this herd.

Introduction

Longhurst described the deer herds of California in 1952, and estimated a population of 14,000 deer in the San Joaquin Deer sub-unit, with an additional 5,000 in the Huntington sub-unit. (Longhurst, 1952) Current herd estimates are suspect due to low reported buck harvest and low sample size during composition counts. Further complicating matters a significant percentage of bucks harvested are taken in areas described as winter range but prior to migratory movement, indicating a sizable resident population. These factors combine to make population estimates unreliable. The herd population appears to have been reduced below the 3,200 estimated in the herd management plan (Peabody, 1983) and is believed to be in decline.

A comprehensive investigation of the deer herd in the San Joaquin River Watershed was initiated by the Department of Fish and Game (Department) in the early 1950's due to the poor condition of the range (Hjersman, 1957). Key wintering areas were identified and an attempt was made to check migration habits by capturing and ear tagging 128 deer. Only 18 observations of marked animals or ear tags were returned, 13 of these observations provided information on migration.

From 1954-1963 ear tags, ear notches, bells and collars were used to identify and monitor deer on the winter range and determine utilization of treated areas and movement within the winter range. An attempt was also made to compare the distribution of marked animals on their summer and winter range and about 10% of the marked animals were located on the summer range (Jordan, 1967). An extensive investigation was also made into habitat types of winter and summer key use areas within the watershed. (Jordan, 1967) Since the 1960's habitat conditions have changed significantly (pers comm., Jordan)

Between 1986 and 1995 the Department captured and equipped deer with ear tags and/or telemetry collars in the San Joaquin River drainage. This project considered three objectives of the San Joaquin Deer Herd Plan (Peabody, 1983): identification and delineation of deer holding areas, summer use areas, and migratory corridors within the San Joaquin Deer Herd boundary. Telemetry equipped deer were monitored on the ground and from the air and a good representation of key use areas for the central portion of the watershed was established. However polygons on some study maps indicated key areas but did not associate them with telemetry locations or describe how that designation was derived. (Sommer, 2004)

This project proposes to capture and equip deer within the San Joaquin River Watershed with GPS telemetry collars and telemetry ear tags. GPS collars will provide specific locations of use data for areas in which we lack knowledge. Data will include: fawning areas within the upper watershed, migration routes, holding areas, summer and winter range use areas. Telemetry ear tags will provide general information, verifying migratory habitats over a significant area where a portion of the deer are believed to be resident, and identifying linking key summer range to wintering areas on the peripheral areas of this watershed were no research has been conducted.

Knowledge gained from this study will assist the Department in giving timely and accurate advice to Forest Service land managers and operators of the several hydroelectric projects throughout this range. Current and accurate knowledge of deer populations for the region are necessary for maximizing benefits to deer through designing habitat enhancement projects and developing mitigations for detrimental project impacts.

Objectives

The study objective is to determine herd boundaries and identify and link key areas and migratory routes through the use of telemetry. Capture effort will be directed at historically identified wintering and holding areas and known deer concentration areas within the watershed including summer key areas, particularly those for which there is no telemetry data. Areas identified as wintering range but which contain deer all year will be targeted to test whether these areas are significant wintering areas or are primarily occupied by resident deer. Secondary objectives are to gather herd health data related to disease and mortality. Habitat at key areas will be described and examined for clues to the herds decline by comparing current and historic summer and fawning areas.

Methods

Study Area

This study site is located on the west slope of the Sierra Nevada, in Madera and Fresno Counties, including the San Joaquin River Watershed above the Kerckhoff Powerhouse. The primary deer herd for this area is described as the San Joaquin Deer Herd but the Oakhurst herd also utilizes portions of the watershed (Longhurst, 1952). The San Joaquin Herd is divided into two segments, the San Joaquin segment to the north and the Huntington segment to the south (Rempel, 1984). The study area ranges from 500-3,600 meters in elevation and covers about 1900 km2.

Study Design

Adult does will be captured throughout the study area. Up to ten does will be captured and equipped with GPS collars per year, over a period of three years. Telemetry ear tags will be used primarily to determine the percentage of migratory deer in areas which are believed to contain a mixture of migratory and resident deer. Ten to twenty deer will be equipped with telemetry ear tags per year. The primary capture methodology will be free range darting. A mixture of Telazol and Xylazine at a 1:1 ratio with 1 mg of each per estimated pound of deer will be used. Tolazoline will be used to reverse Xylazine at a rate of 2 mg/lb. Clover traps may also be used (Clover 1954) in some areas.

Disease screening will be carried out for all captured deer including blood work, hair loss using the regional scoring technique, and exotic louse examinations according to regional protocol.

Telemetry equipped deer will be monitored bi-weekly for location and mortality when possible. Telemetry locations on the summer range will be made primarily from the air using the Department's Cessna and will occur three times over the summer period. Cause of mortality will be determined and documented if possible. Data will be downloaded from recovered collars and these, with data from ear tag transmitters will be

analyzed using ArcMap. Areas which are heavily utilized by GPS collared animals will be examined and described by habitat type and condition.

Products (and estimated dates of completion)

Annual reports detailing the project status, completed tasks, problems encountered and deviations from the approved study design and budgetary summary will be provided to the Central Region Wildlife Management Program Supervisor and routed to LMAC and the Big Game Management Account Advisory Committee (BGMAAC).

Captures for this project will be completed by Mar 31, 2015 and all GPS collars will be retrieved by mid April, 2017. Data analysis is expected to take several months and a final report should be completed by December 31, 2017.

The goal of this project is to develop documents and maps to be referred to for management purposes of this herd. To meet this goal, the following specific objectives have been developed:

- 1. Identify geographic areas important to deer and describe them according to physical characteristics and according to the habits and deer utilizing them.
- Identify key winter areas
- Identify key summer areas
- Identify migratory corridors and holding areas.
- Identify fawning areas (locations used by does from June 15-July 15).
- Describe identified key areas and compare them to historically identified areas.
- 2. Determine meaningful herd boundaries for management purposes.
- Describe the migratory habits or resident nature of deer utilizing geographic segments of this watershed.
- Characterize deer by the range they use.
- 3. Document the existence of exotic louse within the project area.
- 4. Document mineral levels for Copper and Selenium in captured deer,
- 5. A potential for collaboration with Dr. Peter Jordan and or graduate students exists to compare historic data and examine causes for population decline.

Possible Collaborators

Minnesota State University / Dr. Peter Jordan?
United States Forest Service

Program Planning

An annual planning meeting will be held in May or June of each year after the primary capture period, between the investigators and regional senior to evaluate progress and methodology and refine efforts as needed.

Other Resources Requested From CDFG

Staff time and equipment from the Central Region Wildlife Management Program will be used for this study.

Issues to be Resolved

LMAC consideration/support

Association with a University

Required Products

- Annual Progress Reports- June of each Year
- Final Report December 2017
- Data delivery date December 2017

Publications – December 2019

Personnel Requirements and commitments from CDFG

Regional Staff

- 1 Environmental Scientist at 50%
- 2 Environmental Scientist at 5%
- 1 Scientific Aid 20%

Budget Detail - per year budget detail by activity/task and broken down by:

First year

- internal staff time (\$50,000)
- potential collaborator(amount unknown)- collaborators may provide additional value to project
- operating (\$80,000)
 - o Telemetry and capture equipment (\$50,000)
 - o Travel and vehicle expense (\$30,000)

Each of second and third years

- internal staff time (\$50,000)
- collaborator(unknown) collaborators may provide additional value to project
- operating (\$50,000)
 - o Telemetry and capture equipment (\$20,000)
 - o Travel and vehicle expense (\$30,000)

Each of fourth and fifth years

• internal staff time (\$36,000)

- collaborator(unknown) collaborators may provide additional value to project
- operating (\$30,000)
 - o Travel and vehicle expense (\$30,000)

References

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Hjersman, H.A. et al 1957, The San Joaquin Deer Herd and Range, California Department of Fish and Game, 63pp

Jordan, Peter A. 1967. Ecology of Migratory Deer in the San Joaquin River Drainage, University of California, Berkeley, 278pp

Longhurst, W.M. et al 1952. A Survey of California Deer Herds Their Ranges and Management Problems University of California Berkeley, 136pp

Peabody, E.A. 1983. Management Plan for the San Joaquin Deer Herd, California Department of Fish and Game, 62pp

Rempel, R. 1984. Management Plan for the Huntington Segment of the San Joaquin Deer Herd, California Department of Fish and Game, 29pp

Sommer, M. 2004. San Joaquin Deer Herd Study Results Summary, California Department of Fish and Game internal paper, 6pp